Anomalous Ultra-small-angle X-ray Scattering From Voids and Secondary Phases As a Function of Ceramic Deformation

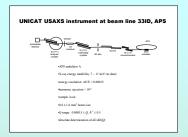
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Abstract

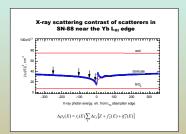
Creep cavitation is one of the principal factors limiting the use of silicon nitride in high temperature applications. Recently, it has been shown that its performance can be improved significantly by adding a reflactory crystalline secondary phase and redealing also with high orbening temperature. High creep resistance appears to result from the new types of intering additiver. This reservacion was understone explore the limits of creep performance of next generation silicon initiate by measuring the void population and the econdum's next more rounded in the conduction as a function of deformance.

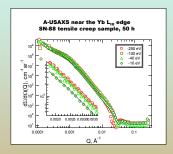
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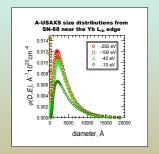


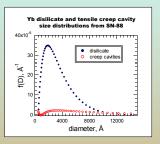
A-USAXS, the basics scattering vector magnitude $Q = (4\pi/\lambda)\sin\theta$ intensity of scattering $I(Q) = \frac{d}{d\Omega}(Q, E) = \sum_{i} |\Delta_{P_i}(E)|^2 \int_{0}^{\pi} N_i(D)F^2(D)|F(Q, D)|^2 dD$ intensity, simplified $I(Q, E) = \int_{0}^{\pi} \phi(D, E) G(Q, D) dD$ Use scattering contrast to expensity $|D| = |\Delta_{P_i \text{distinct}}(E)|^2 \int_{\text{finition}} (D) + |\Delta_{P_i \text{out}}|^2 \int_{\text{finition}} (D)$ determination of every cavity $f_{\text{proposition}}(D) = f_{\text{out}, \text{page}}(D) - f_{\text{out}, \text{page}}(D)$











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